

REMARKS

Disposition of the Claims

Claims 1-27 were previously canceled. Claims 28-31 are withdrawn from consideration. Claims 32 through 37 are amended.

Claim Rejections under 35 U.S.C. §112

Rejection of Claims 34 through 37 under 35 U.S.C. §112

The Office Action rejected claims 34 through 37 under 35 U.S.C. §112, first paragraph, as failing to comply with the written description requirement. The Office Action states on page 2, second paragraph that:

"There is no teaching in the original specification that "the network element is operable to determine pass-through wavelengths in response to the wavelengths transmitted in a first direction by the network element ARE NOT EQUAL TO THE WAVELENGTHS SPECIFIED IN THE WAVELENGTH TOPOLOGY MAP BEING TRANSMITTED BY THE ADJACENT NETWORK ELEMENT IN THE SECOND DIRECTION" (emphasis added) of claims 34 and 36. "Determine pass-through wavelengths in response to the wavelengths being dropped from a second direction by the network elements ARE NOT EQUAL TO THE WAVELENGTHS SPECIFIED IN THE WAVELENGTH TOPOLOGY MAP BEING TRANSMITTED BY THE ADJACENT NETWORK ELEMENT IN A SECOND DIRECTION TO THE NETWORK ELEMENT" of claim 35."

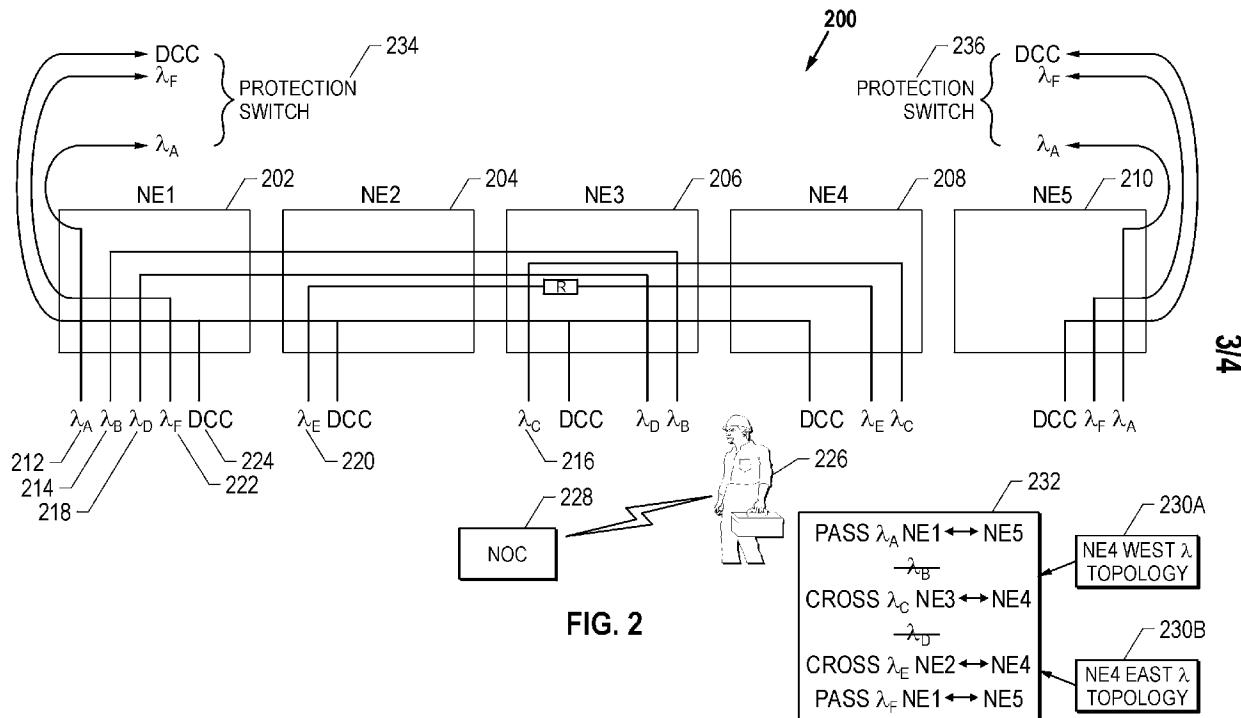
This rejection under 35 U .S.C. §112, first paragraph is respectfully traversed. The specification describes an embodiment at, *inter alia*, paragraphs 21 and 22 of the corresponding US Published Application No. 20050141437:

"[0021] The following illustrative example further explains wavelength insertion and the responses to receiving a forwarded map portion. An originating NE inserts a wavelength and sends wavelength information in the form of a map

corresponding to the inserted wavelength to an adjacent NE indicating to the adjacent NE the wavelength and the name of the originating NE that inserted the signal. The adjacent NE checks to see if it is inserting the same wavelength back towards the originating NE that provided the wavelength information, i.e., the adjacent NE checks to see if it forms a cross-connection with the originating NE that provided the wavelength information.

[0022] If the adjacent NE is inserting the wavelength back upstream towards the originating NE, then the adjacent NE sends wavelength information back to the originating NE such that the originating NE has information about the destination of the signal it just inserted. On the other hand, if the adjacent NE does not insert the wavelength back towards the originating NE, then the wavelength is passed through and the adjacent NE updates its wavelength information to reflect that the wavelength is a passthrough wavelength sourced from the originating NE. Eventually, as the wavelength and wavelength information continues the propagation, the NE that is capable of transponding with the originating NE will receive the wavelength map and propagate its wavelength map information back through the intervening adjacent NEs to the originating NE.”

In the embodiment described in paragraphs 21 and 22 of the corresponding US Published Application No. 20050141437, an originating NE (such as NE2 shown in Figure 2 below) inserts a wavelength to an adjacent NE in a first direction (such as wavelength λ_f to NE4 in the east direction). The adjacent NE checks to see if it is inserting the same wavelength back towards the originating NE that provided the wavelength information, i.e., the adjacent NE checks to see if it forms a cross-connection with the originating NE that provided the wavelength information. If the adjacent NE is inserting the wavelength back upstream towards the originating NE, then the adjacent NE sends wavelength information back to the originating NE such that the originating NE has information about the destination of the signal it just inserted. On the other hand, if the adjacent NE does not insert the wavelength back towards the originating NE, then the wavelength is passed through and the adjacent NE updates its wavelength information to reflect that the wavelength is a passthrough wavelength sourced from the originating NE.



The specification thus describes how a network element is operable to determine passthrough wavelengths in response to comparing the wavelengths inserted in a first direction by the network element to the wavelengths specified in the wavelength topology map as inserted by the adjacent network element in a second direction to the network element. As such, claims 34 through 37 meet the written description requirements under 35 U.S.C. §112, first paragraph.

Rejection of Claim 35 under 35 U.S.C. §112

The Office Action rejected claim 35 under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The Office Action states on page 3, fourth paragraph that:

“It is not clear what he applicant is claiming in regard to claim 35. How can passthrough wavelengths be dropped? It is unclear where it is passed through and where it is dropped.”

The specification describes an embodiment in paragraph 19 of the corresponding US Published Application No. 20050141437. It states:

“[0019] The network elements NE1 102 through NE5 110 may be any type of network element performing various wavelength related tasks such as adding wavelengths, dropping wavelengths, regenerating wavelengths and providing for the passage of wavelengths therethrough, for example. As depicted, wavelengths 112-122, which are respectively labeled λ_A , λ_B , λ_C , λ_D , λ_E , and λ_F , are transmitted on an optical medium from West to East, i.e., from the direction of NE1 102 to the direction of NE5 110 and from the East to West direction as well in order to form a cross-connection. Further, it should be understood by those skilled in the art that the terms "East" and "West" do not necessarily refer to the cardinal directions of geography. Since the East or West designations have no real meaning, other means are provided for specifying the directionality. For instance, supervisory channels designated as SPV1 and SPV2 are chosen to indicate an overhead Data Communications Channel (DCC) 128 supervision frequency that is flowing out of or into a multiplexer board connected to the ring network. Specifically, wavelength 112 is inserted at NE1 102 and travels through network elements NE2 104-NE4 108 to NE5 110 where wavelength 112 is dropped. Additionally, as part of the cross-connection NE5 110 inserts wavelength 112, which travels to NE1 102. Similarly, for wavelengths 114, 118, and 122 cross-connections are formed between NE1 102 and NE3 106, NE3 106, and NE5 110, respectively. Wavelength 116 is inserted and dropped at each of NE3 106 and NE4 108 and wavelength 120 is inserted and dropped at each of NE2 104 and NE4 108 in order to form cross-connections. Additionally, wavelengths 120 and 122 are regenerated at NE3 106 as indicated by regeneration indicia 124 and 126. In the present invention, as will be explained in more detail hereinbelow, the network elements 102-110 respectively discover wavelengths and generate a wavelength topology map of the wavelengths inserted and dropped thereat and wavelengths passed therethrough. For example, NE2 104 generates an East wavelength topology map that indicates wavelength 120 is inserted at NE2 104

and wavelengths 112, 114, 118, and 122 are passed therethrough. Those skilled in the art will readily recognize that in actual implementation, each NE internally maintains two direction-specific topology maps, one for each "side/direction" (e.g., East or West) of the ring network. When the user/craft wishes to retrieve the topology information for the NE, the information contained in the two internal maps is processed in relationship to each other in order to provide the user/craft with the needed information."

As described above, passthrough wavelengths are transmitted to a network element but are not added, e.g. generated by transponders on the network element, or dropped by the network element. The wavelengths are "passed through" the network element. As such, the network element may not be aware of the identity of the wavelength passed through the network element. Claim 35 states that, "wherein the network element is operable to determine passthrough wavelengths in response to comparing wavelengths being dropped from the second direction by the network element to the wavelengths specified in the wavelength topology map as inserted by the adjacent network element in the a second direction to the network element." As explained above, when an adjacent network element specifies that a wavelength is transmitted to the network element in a direction and the network element has not dropped that wavelength, than the wavelength may be determined to be a passthrough wavelength.

The term "passthrough wavelength" is thus described by the specification such that a person of skill in the art may understand the scope of the invention. "Determining whether a claim is definite requires an analysis of 'whether one skilled in the art would understand the bounds of the claim when read in light of the specification If the claims read in light of the specification reasonably apprise those skilled in the art of the scope of the invention, § 112 demands no more.'" *Personalized Media Communications, LLC v. U.S. Int'l Trade Comm'n*, 161 F.3d 696, 48 USPQ2d 1880 (Fed. Cir. 1998) (citing *Miles Lab., Inc. v. Shandon, Inc.*, 997 F.2d 870, 875, 27 USPQ2d 1123, 1126 (Fed. Cir. 1993) and finding that term digital detector is definite because the written description of the specification was sufficient to inform one skilled in the art of the meaning of the claim language). As such, claim 35 meets the requirements under 35 U.S.C. §112, second paragraph.

Claim Rejections under 35 U.S.C. §103

The Office Action rejected claims 32 through 37 under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5781537 to Ramaswami, et al (the Ramaswami reference) in view of US Application No. 2002/01781886 to Wu et al (the Wu reference). This rejection is traversed because neither the Ramaswami reference or the Wu reference, either alone or in combination, disclose or suggest the requirements of the claims.

Independent Claim 32 and dependent claims 33 through 34

Independent Claim 32 states, “a plurality of transponders for generating a plurality of wavelengths inserted in a first direction over the optical WDM ring network, wherein at least one of the plurality of wavelengths inserted in the first direction is received by the network element in a second direction from another network element in the optical WDM ring network to form a cross-connection; a receiver for receiving a wavelength topology map over a dedicated overhead wavelength channel from an adjacent network element in the optical WDM ring network, wherein the wavelength topology map includes a map portion that specifies the wavelengths inserted by the adjacent network element in a second direction to the network element; wherein the network element is operable to determine passthrough wavelengths from the wavelength topology map.”

The Office Action cites column 7, lines 29 through 60 of the Ramaswami reference that describes a topology database. It states that:

“Every node in the network maintains a topology database that reflects its knowledge of the nodes that are up, the highest timestamp of update messages received from each such node, the links that are up next to each node and their wavelength usage. Whenever a node receives an update message about another node with a later timestamp than the stored one, it updates the corresponding information and propagates it by sending the update message to all neighbors <E1>-<E4>. The topology information is used by nodes to decide the path of a new lightpath it intends to establish.”

As stated above, the topology information is used to decide the path of a new lightpath it intends to establish. There is no description of a wavelength topology maps from the adjacent network element in the optical network that specifies the wavelengths being transmitted by the adjacent network element in a second direction to the optical network element; wherein said optical network element is operable to determine passthrough wavelengths from the wavelength topology map.

In fact, the Ramaswami reference teaches away from the requirements of claim 32 of a wavelength topology map from the adjacent network element in the optical network, wherein the wavelength topology map includes a map portion that specifies the wavelengths being transmitted by the adjacent network element in a second direction to the optical network element. The Ramaswami reference states in column 4 line 64 through column 5, line 10 that:

“Every lightpath is identified by a lightpath-id that consists of a quadruple (originator, destination, wavelength, sequence number). Two different lightpaths may carry the same sequence number if they have different originators, destinations or wavelengths. The lightpath-id is assigned by the originator and we assume that the sequence number contains enough bits so that no wrap around occurs. This means that in our protocol we can assume that once a lightpath-id quadruple is assigned, it will never be reassigned to another lightpath (in practice, it may be reassigned a very long time after the previous one was taken down, long enough to ensure that there is no trace of the old lightpath in the entire network).

The lightpath-id is carried in all control messages related to the lightpath.”

As described above, the Ramaswami teaches that a lightpath-id is assigned by an originator of the light-path and is sent in control messages related to a lightpath. This method of a light-path id teaches away from exchanging a wavelength topology map and determining passthrough wavelengths from the wavelength topology map.

The Wu reference fails to add to the teachings of the Ramaswami reference. Nowhere does the Wu reference disclose that a network element with an optical architecture updates topology maps or determines passthrough wavelengths at each network element.

Furthermore, the combination of the reference fails to suggest the requirements of the claims. Neither reference discloses or suggests the problem solved by the present invention, described in paragraph 4, of a craftpersons interfacing with an optical network element not having an indication of passthrough traffic in the network element to check prior to maintenance operations. As stated in paragraph 31, by updating the first and second topology maps, the source and destination information may be discovered for all wavelengths in the network and the updated wavelength topology maps may be utilized to provide a craft person an indication of the passthrough wavelengths in the network elements. Thus, the combination of the Ramaswami reference and the Wu reference fail to disclose or suggest the requirements of claim 32.

The Office Action has failed to prove that the cited references disclose or suggest the elements of claim 32 under 35 U.S.C. §103. The dependent claims 33 through 35 add further patentable matter to Claim 32 and thus are further differentiated and patentable under 35 U.S.C. §103 over the cited references.

Independent claim 36 and dependent claim 37

Independent claim 36 states, “inserting in a first direction a first set of wavelengths over the optical WDM ring network; receiving in a second direction one of the first set of the wavelengths over the optical WDM ring network from another network element in the optical WDM ring network to form a first cross-connection; inserting in a second direction a second set of wavelengths over the optical WDM ring network; receiving in a first direction one of the second set of wavelengths over the optical WDM ring network from another network element in the optical WDM ring network to form a second cross-connection; receiving a first wavelength topology map from a first adjacent network element in the optical WDM ring network over a dedicated overhead wavelength channel, wherein the first wavelength topology map includes a first map portion that specifies wavelengths inserted by the first adjacent network element in the a first direction to the network element; receiving a second wavelength topology map from a second adjacent network element in the optical WDM ring network over a dedicated overhead wavelength channel, wherein the second wavelength topology map includes a second map portion that specifies wavelengths inserted by the second adjacent network element in a second direction to the network element; determining passthrough wavelengths in response to determining wavelengths inserted in a first direction by the network element are not equal to

wavelengths specified in the second wavelength topology map as inserted by the second adjacent network element in a second direction to the network element; and determining passthrough wavelengths in response to determining wavelengths inserted in a second direction by the network element are not equal to wavelengths specified in the first wavelength topology map as inserted by the first adjacent network element in a first direction to the network element.”

The cited references fail to disclose or teach the elements of claim 36 and dependent claim 37 for similar reasons stated with respect to claim 32.

CONCLUSION

For the above reasons, the foregoing amendment places the Application in condition for allowance. Therefore, it is respectfully requested that the rejection of the claims be withdrawn and full allowance granted. Should the Examiner have any further comments or suggestions, please contact Jessica Smith at (972) 240-5324.

Respectfully submitted,
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